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Properties of amorphous FeCoB alloy particles (abstract)

S. W. Charles, S. Wells, and A. Meagher
Department of Physics, University College of North Wales, Bangor, Gwynedd, United Kingdom
S. Mørup and J. van Wonterghem
Laboratory of Applied Physics II, Technical University of Denmark DK-2800, Lyngby, Denmark

Amorphous and crystalline alloy particles (0.05–0.5 μm) of $Fe_xCo_yB_z$ in which the ratio y:x ranges from 0 to 0.1 have been prepared by the borohydride reduction of iron and cobalt salts in aqueous solution. The structure of the particles has been studied using Mössbauer spectroscopy and x-ray diffraction. Magnetic measurements of the saturation magnetization, coercivity, and remanence of the particles have been measured. The transition from the amorphous-to-crystalline state has been studied using differential scanning calorimetry (DSC) and thermomagnetometry up to a temperature of 450 °C (see Fig. 1). It has been shown that the fraction of boron in the alloys (10–35 at. %) is dependent upon the rate of addition of salts to borohydride and the concentration of cobalt present; this in turn influences the crystallinity and magnetic properties.

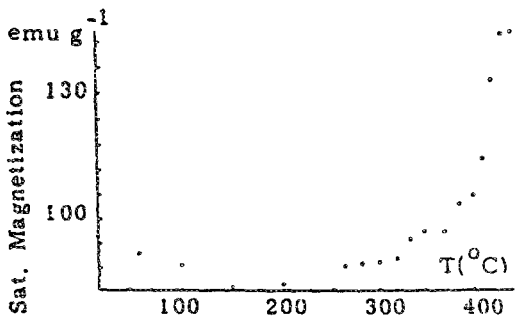

FIG. 1.

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